Stem-and-Leaf Plots

Spot mistakes, reason, and work backward

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

Read place value from the key: $5|2 = 52$ uses tens and ones. Sort leaves within each stem. Each leaf represents one observation, even if a digit or a value repeats.

Worked example

Read $5|2\ 5\ 5$ and $6|0$ with key $5|2 = 52$. Find how many values exceed 53.

1. Stem 5 gives $52, 55, 55$; stem 6 gives 60.
2. Keep both leaves 5 in stem 5: both values of 55 exceed 53.
3. The 60 also exceeds 53. The count is $2 + 1 = 3$.
Answer: 3 values exceed 53.

Practice Problems

Show your thinking.

1. The key is $1|4 = 1.4$ minutes. A student reads $2|5$ as 25 minutes. Correct that reading and list all the times, keeping repeats.

stem	leaves
1	4 9
2	1 5 5
3	0

2. A report averages the endpoints and calls 20 the median. Correct the report and explain what must be averaged, if anything. Key $2|3 = 23$.

stem	leaves
0	9
1	2 5 8 9
2	7
3	1

3. The last leaf is missing, but the range is 27. Recover the largest value and fill its leaf. The plot is ordered. Key $2|3 = 23$.

stem	leaves
1	6 9
2	3 5
3	0 8
4	1 ?

4. A report counts each leaf digit just once, even across different stems. Find the total observations and the number of distinct full values. Use leaf 1 to explain the error. Key $2|3 = 23$.

stem	leaves
2	1 7
3	1 1 5
4	1 7

5. For $28, 21, 27, 27, 32$, a student writes $2|8\ 1\ 7\ 7\ 12$. Repair the rows and explain why 12 cannot be a leaf. Key $2|3 = 23$.

6. This plot was published without a key. One reader uses $2|3 = 23$; another uses $2|3 = 2.3$. Find the mode under each key. What can be reported without knowing the key?

stem	leaves
1	1 6
2	3 3

Answer Key

1. $2|5 = 2.5$ minutes; times $1.4, 1.9, 2.1, 2.5, 2.5, 3.0$ minutes.
2. Median 18; take the middle observation, not the endpoints.
3. Maximum 43; missing leaf 3 on stem 4.
4. 7 observations, 6 distinct values. Leaf 1 can mean 21, 31, or 41.
5. $2|1\ 7\ 7\ 8$ and $3|2$. Each leaf is a single ones digit.
6. Mode 23 or 2.3, depending on the key; it occurs twice either way.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The key uses the stem as ones and each leaf as tenths: $2 + 5/10 = 2.5$.
2. The stem 1 gives $1.4, 1.9$; stem 2 gives $2.1, 2.5, 2.5$.
3. Stem 3 with leaf 0 gives 3.0. Both leaves 5 on stem 2 stay.

Problem 2

1. The extremes 9 and 31 average to $(9 + 31)/2 = 20$, but they are not the middle of the list.
2. There are 7 observations, so the median position is $(7 + 1)/2 = 4$.
3. The fourth value is 18. One observation sits in the middle, so no averaging is needed.

Problem 3

1. The first value is 16. The maximum is the minimum plus the range.
2. The maximum is $16 + 27 = 43$. It comes after the shown 41.
3. Use the ones digit $43 - 40 = 3$ on stem 4. The range checks: $43 - 16 = 27$.

Problem 4

1. Count every leaf: $2 + 3 + 2 = 7$ observations.
2. Leaf 1 occurs with stems 2, 3, and 4; these decode to different values $21, 31, 41$.
3. Only 31 appears twice as a full value. The distinct count is $7 - 1 = 6$.

Problem 5

1. Sort the twenties as $21, 27, 27, 28$. Their leaves are $1, 7, 7, 8$.
2. The 32 belongs on stem 3 with leaf $32 - 30 = 2$, not as leaf 12 on stem 2.
3. The corrected plot retains $4 + 1 = 5$ values, including both copies of 27.

stem	leaves
2	1 7 7 8
3	2

Problem 6

1. Both readings have the same 4 leaves, and leaf 3 on stem 2 repeats.
2. With tens and ones that pair gives $2(10) + 3 = 23$. With ones and tenths it gives $2 + 3/10 = 2.3$.
3. Its frequency is 2 under either key. The value itself cannot be reported without place value.

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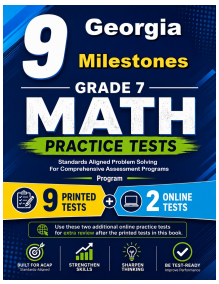

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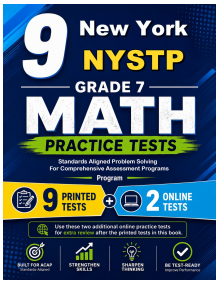

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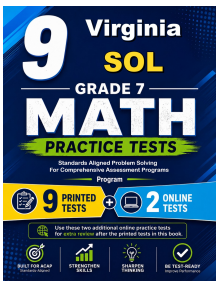

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